

REMARKS

Claims 1, 9-13, 17-19 and 24 are pending in the application. By this Amendment, claims 1, 9, 13, 17 and 19 are amended and claim 23 is canceled without prejudice or disclaimer. Various amendments are made for clarity and are unrelated to issues of patentability.

The Office Action rejects claim 1 under 35 U.S.C. §103(a) over Embodiment 2 of U.S. Patent 6,249,087 to Takayama et al. (hereafter Takayama) in view of Embodiment 8 of Takayama. The Office Action also rejects claims 9, 11-13, 17, 19 and 23 under 35 U.S.C. §103(a) over Embodiment 2 of Takayama in view of Embodiment 8 of Takayama and U.S. Patent Publication 2002/0075206 to Takeda. Still further, the Office Action rejects claim 10 under 35 U.S.C. §103(a) over Embodiment 2 of Takayama in view of Embodiment 8 of Takayama, Takeda and U.S. Patent 6,747,614 to Takayama (hereafter Takayama 614). The Office Action also rejects claims 18 and 24 under 35 U.S.C. §103(a) over Embodiment 2 of Takayama in view of Embodiment 8 of Takayama, Takeda and U.S. Patent Publication 2002/0063663 to Homma. The rejections are respectfully traversed with respect to the pending claims.

Independent claim 9 recites a plasma display panel (PDP) having scan electrodes and sustain electrodes to form a plurality of electrode pairs, and a first driving circuit that initializes discharge cells by applying a first signal having an initialing pulse to the scan electrodes during a reset period of at least one sub-field, the initialing pulse increasing to a first maximum voltage value, wherein the first signal further has a first decreasing pulse provided after the initialing pulse during the reset period of the at least one sub-field. Independent claim 9 also recites the first driving circuit applies a second signal having an enhancing pulse to the scan electrodes after

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applying the first signal in the reset period and before an address period of the at least one sub-field, wherein the second signal further has a second decreasing pulse provided after the enhancing pulse in the at least one-sub-field, the enhancing pulse increasing to a second maximum voltage value less than the first maximum voltage value. Still further, independent claim 9 also recites the first decreasing pulse is provided until a voltage provided to the scan electrodes reaches a first voltage value, and the second decreasing pulse is provided until the voltage provided to the scan electrodes reaches a second voltage value, wherein the first and second voltage values are different. Independent claim 9 also recites that a ground voltage is applied to the sustain electrodes when the enhancing pulse is applied to the scan electrodes.

The applied references do not teach or suggest at least these features of independent claim 9. More specifically, the Office Action (on pages 3-5) states that Takayama's FIG. 7 (Embodiment 2) discloses applying a first signal having an initialing pulse $V1y$ to scan electrodes during a reset period TR and applying a second signal having an enhancing pulse $V2y$ to the scan electrodes after applying the first signal in the reset period TR and before an address period TA of the at least one sub-field. The Office Action also asserts that Takayama's FIG. 7 discloses a second decreasing pulse $V3y$ provided after the enhancing pulse $V2y$, where the enhancing pulse $V2y$ is increased to a second maximum voltage less than a first maximum voltage value. The Office Action states that Takayama's FIG. 7 does not disclose the claimed first decreasing pulse provided after the initialing pulse $V1y$ during the reset period. The Office Action then cites Takayama's FIG. 15 (Embodiment 8) as disclosing a decreasing pulse $V22y$ after the initialing pulse (believed to be $V21y$) during the reset period of the at least one sub-field.

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Takayama's FIG. 7 and FIG. 15 may not be simply combined and/or modified as asserted in the Office Action. The Office Action clearly relies on impermissible hindsight to combine these two embodiments. The Office Action (on page 5) states that the motivation to modify Embodiment 2 is for the purpose of precisely controlling discharge in a display to improve quality of the display and to minimize the number of times needed to do the refresh period. However, the alleged motivation is not based on prior art. Takayama relies on different combinations of charge forming and charge adjusting steps. For example, FIG. 7 includes three steps in the preparation period TR. See col. 12, lines 1-15. FIG. 15 includes an order for each of the electrodes to perform a charge forming and a charge adjusting. See col. 14, lines 26-40. Takayama does not suggest the modification as alleged in the Office Action.

Takayama's FIG. 7 shows a display electrode Y(1) having an increasing voltage V1y during a first step and another increasing voltage V2y (i.e., the alleged enhancing pulse) during a second step. FIG. 7 also shows a display electrode X having a decreasing voltage V2x at a same time as the voltage V2y (during the second step). This does not teach or suggest that a ground voltage is applied to the sustain electrodes when the enhancing pulse is applied to the scan electrodes, as recited in independent claim 9.

Takayama's FIG. 15 shows a display electrode Y(1) having increasing voltages V21y, V31y during a charge forming and decreasing voltages V22y, V32y during charge adjusting. FIG. 15 also shows display electrode X having increasing voltages V11x, V22x and decreasing voltages V12x, V21x. The Office Action only relies on the decreasing pulse V22y of FIG. 15. Thus, FIG. 15 also does not teach or suggest that a ground voltage is applied to the sustain

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electrodes when the enhancing pulse is applied to the scan electrode, as recited in independent claim 9.

When discussing features of dependent claim 13, the Office Action (on page 6) states that Takayama and Takeda do not teach that a ground voltage is applied to the sustain electrode when the second gradually rising waveform is applied to the scan electrodes. The Office Action then asserts that Takeda's FIG. 5 discloses that a ground voltage is applied to sustain electrodes (SUS) when a second gradually rising waveform A11 is applied to scan electrodes (SCN). However, the ground voltage applied to the sustain electrodes (in Takeda's FIG. 5) occurs within a setup period. Takeda's setup period does not relate to an enhancing pulse. Takeda's setup period also does not relate to an enhancing period after applying the first signal (having an initialing pulse). That is, the ground voltage shown in Takeda's FIG. 5 does not correspond to the alleged enhancing pulse in Takayama's FIG. 7. There is no suggestion to modify Takayama's FIG. 7 based on Takeda's disclosure of a ground voltage during a setup period. The Office Action cites Takeda's paragraph [0031] as the basis for the modification of Takayama. However, the cited paragraph relates to suppressing discharge errors in a setup period. This does not correspond to Takayama's second step of the preparation period TR.

For at least the reasons set forth above, Embodiment 2 of Takayama, Embodiment 8 of Takayama and Takeda do not teach or suggest that the first driving circuit applies a second signal having an enhancing pulse to the scan electrodes after applying the first signal in the reset period and before an address period of the at least one sub-field, wherein the second signal further has a second decreasing pulse provided after the enhancing pulse in the at least one-sub-field, the

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enhancing pulse increasing to a second maximum voltage value less than the first maximum voltage value, wherein the first decreasing pulse is provided until a voltage provided to the scan electrodes reaches a first voltage value, and the second decreasing pulse is provided until the voltage provided to the scan electrodes reaches a second voltage value, wherein the first and second voltage values are different, and wherein a ground voltage is applied to the sustain electrodes when the enhancing pulse is applied to the scan electrodes. Homma does not teach or suggest the missing features of independent claim 9. Thus, independent claim 9 defines patentable subject matter.

Independent claim 19 recites providing a first signal including an initialing pulse followed by a first decreasing pulse to the scan electrode during an initialization period of at least one sub-field, and providing a second signal including an enhancing pulse followed by a second decreasing pulse to the scan electrode after providing the first signal and during the at least one sub-field, wherein a lowest voltage of the first decreasing pulse is less than a lowest voltage of the second decreasing pulse, wherein a ground voltage is provided to the sustain electrode when the second signal is provided to the scan electrode. Independent claim 19 also recites providing a scan signal to the scan electrode during an address period of the at least one sub-field, the scan signal being provided after the second signal in the at least one sub-field, providing at least one sustain signal to at least one of the scan electrode or the sustain electrode during a sustain period of the at least one sub-field, wherein the initialing pulse of the first signal has a first peak voltage value, and the enhancing pulse of the second signal has a second peak voltage value, and wherein the first peak voltage value is greater than the second peak voltage value.

For at least similar reasons as set forth above, the applied references do not teach or suggest at least these features of independent claim 19. More specifically, Embodiment 2 of Takayama, Embodiment 8 of Takayama and Takeda do not teach or suggest providing a second signal including an enhancing pulse followed by a second decreasing pulse to the scan electrode after providing the first signal, wherein a ground voltage is provided to the sustain electrode when the second signal is provided to the scan electrode. Thus, independent claim 19 defines patentable subject matter.

Independent claim 1 recites a set-up supplier for supplying an initialing pulse to scan electrodes in an initialization period and for supplying a positive enhancing pulse to the scan electrodes during an enhancing period following said initialization period, wherein the initialing pulse increases to a peak voltage and the positive enhancing pulse has a maximum voltage less than the peak voltage. Independent claim 1 also recites a negative voltage supplier for supplying a decreasing pulse to the scan electrodes in the initialization period and for supplying a negative enhancing pulse to the scan electrodes during the enhancing period. Independent claim 1 also recites that a ground voltage is applied to the sustain electrodes when the positive enhancing pulse is applied to the scan electrodes and when the negative enhancing pulse is applied to the scan electrodes.

For at least similar reasons as set forth above, the applied references do not teach or suggest all the features of independent claim 1. More specifically, Embodiment 2 of Takayama, Embodiment 8 of Takayama and Takeda do not teach or suggest supplying a positive enhancing pulse to the scan electrodes during an enhancing period following said initialization period and

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supplying a negative enhancing pulse to the scan electrodes during the enhancing period, and wherein a ground voltage is applied to the sustain electrodes when the positive enhancing pulse is applied to the scan electrodes and when the negative enhancing pulse is applied to the scan electrodes. Homma does not teach or suggest the features of independent claim 1 missing from Takayama. Thus, independent claim 1 defines patentable subject matter.

For at least the reasons set forth above, each of independent claims 1, 9 and 19 defines patentable subject matter. Each of the dependent claims depends from one of the independent claims and therefore defines patentable subject matter at least for this reason. In addition, the dependent claims recite features that further and independently distinguish over the applied references.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of claims 1, 9-13, 17-19 and 24 are earnestly solicited. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this,

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concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
KED & ASSOCIATES, LLP



David C. Oren

Registration No. 38,694

P.O. Box 221200

Chantilly, Virginia 20153-1200

(703) 766-3777 DCO/kah

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Please direct all correspondence to Customer Number 34610